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BD

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/254,118    05/19/99    TATSUMI    K    52433/544

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MMC2/0606

EXAMINER

DIETRICH, M

ART UNIT

PAPER NUMBER

2814

DATE MAILED:

06/06/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

## Office Action Summary

### Application No.

09/254,118

### Applicant(s)

TATSUMI ET AL.

### Examiner

Michael Dietrich

### Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 May 1999.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some \* c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☒ received.
2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_\_.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

### Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)                      18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      20) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-4 and 6 are rejected under 35 U.S.C. 102(a) as being anticipated by Hoshiba et al.

Hoshiba et al discloses small balls B that are to be melted onto an inner lead of a film carrier, electrode pads of a chip, electrode pads of a printed circuit board or electrode pads of a flexible circuit board, so as to plate the electronic device with a different metal (see col. 9 lines 21-24).

In regards to claim 2, the balls are arranged and held in holes 14 of a base plate 13. The base plate 13 is positioned over an electronic device and lower to contact the balls B onto the electronic device, where the balls B are bonded to an electrode pad.

In regards to claim 3, the excess balls B removed from the base plate 13 by applying vibrations 16 to the base plate 13 (see col. 9 lines 32-48).

In regards to claim 4, the vibrations are ultrasonic vibrations (see col. 9 lines 32-33).

In regards to claim 6, the balls are formed of gold (see col. 11 lines 59-60).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshiba et al in view of Le Coz et al.

In regards to claim 5, Hoshiba et al discloses the balls are formed from a conductive metal (see col. 8 line 57), but fails to specifically disclose tin. However, Le Coz et al discloses a base plate 11 with holes 13 for holding tin/lead solder balls 15. The tin/lead solder balls 15 are aligned with conductive pads 55 of substrate 51, and bonded thereto. Therefore, it would have been an obvious design choice to use tin/lead solder for the material of the balls of Hoshiba et al, since Hoshiba et al discloses the balls comprise of a metal and tin/lead solder balls are known in the art of base plate attachment to be a good electrical conductor, as shown by Le Coz et al.

In regards to claims 7 and 8, Hoshiba et al discloses the balls to be connected to electrode pads of a chip, electrode pads of a printed circuit board or electrode pads of a flexible circuit board, but fails to specifically disclose a ceramic substrate of copper wiring. However, Le Coz et al discloses copper wiring are formed on a ceramic substrate (see col. 1 lines 40-55). Balls 15 that are held in holes 13 of base plate 11 are connected to the copper wiring. Therefore, it would have been to one of ordinary skill in the art to use a ceramic substrate and copper wiring with Hoshiba et al, since using

ceramic substrates and copper wiring are well known in the art of ball attachment with a base plate to provide a good insulating substrate and electrical conductive wiring, as shown by Le Coz et al.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshiba et al in view of Dunaway et al.

In regards to claim 9, Hoshiba et al discloses the balls can be connected to a lead frame but fails to disclose a plated lead of a lead frame. However, Dunaway et al discloses a copper lead 76 that is plated with a metal 78. A bump 80 is attached to the plated lead 76 to form an excellent electrical connection. Therefore, it would have been obvious to one of ordinary skill in the art to use a plated lead with Hoshiba et al, since Hoshiba et al discloses the balls can be attached to a lead frame and a plated lead would have added the benefit of the plating material also adhering to the ball, and forming a good electrical connection, as shown by Dunaway et al.

### ***Conclusion***

1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Mike Dietrich** at **(703) 305-0381** and between the hours of 8:00 AM to 4:00PM (Eastern Standard Time) Monday through Friday or by E-mail via **Michael.Dietrich@uspto.gov**. The Art Unit 2814 **Fax Center number** is **(703) 308-7722; -7724**. Primary Examiner Don Monin can be reached at (703) 308-4895. Any

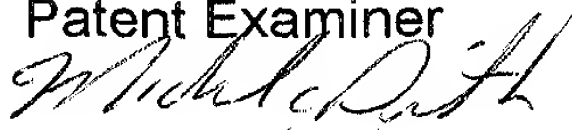
Application/Control Number: 09/254,118

Page 5

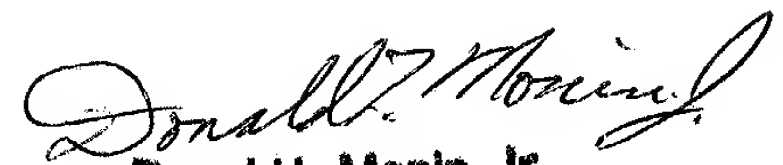
Art Unit: 2814

inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

Patent Examiner



Michael C. Dietrich



Donald L. Monin, Jr.  
Primary Examiner